AMENDMENTS TO THE CLAIMS

1-14. (Canceled)

15. (Original) Radiation sensing apparatus, comprising:

a detector assembly, comprising an array of detector elements, positioned to receive X-ray photons emitted over a range of angles and to generate a signal indicative of respective charges accumulated by the detector elements due to the photons that are incident on the elements; and

a processor, which is coupled to receive the signal from the detector assembly and to determine, responsive to the signal, whether a high flux of the photons or a low flux of the photons was incident on each of the elements, and to estimate the number of photons incident on each of the elements by dividing the charges accumulated by the elements on which the high flux was incident by a high-flux average charge, and dividing the charges accumulated by the elements on which the low flux was incident by a low-flux average charge, substantially different from the high-flux average charge.

16. (Original) Apparatus according to claim 15, wherein the low flux is considered to be incident on one of the elements when no more than a single one of the photons is incident on the element over a period during which the charges are accumulated.

17. (Original) Apparatus according to claim 16, wherein for the elements on which the low flux was incident, the processor is adapted to divide the charges accumulated by a mutually-adjacent pair of the elements by the low-flux average charge, so as to determine whether one of the photons was incident on one of the elements in the pair.

18. (Original) Apparatus according to claim 15, wherein the detector assembly is adapted to receive the X-ray

photons reflected by a sample over the range of angles, characterized by a variation of flux of the reflected photons as a function of angle, such that the high flux is incident on the elements in a low-angle portion of the range, and the low flux is incident on the elements in a high-angle portion of the range.

19. (Currently amended) ~~A detector~~ An assembly for testing a sample, comprising:

a radiation source, which is adapted to irradiate the sample;

an array of detector elements, positioned to receive radiation from the sample and to generate a signal responsive thereto, the array ~~including a first element and a last element and~~ having a length ~~defined by a distance between the first and last elements~~; and

an ~~evacuable~~ enclosure that is capable of being evacuated, the enclosure having a front side and a rear side separated by a distance that is at least equal to the length of the array, wherein the array is positioned at the rear side of the enclosure, and the enclosure comprises a window at a front side thereof, which is adapted to allow the radiation from the sample to pass therethrough so as to impinge on the array.

20. (Original) An assembly according to claim 19, wherein the front and rear sides of the enclosure are separated by a distance of at least twice the length of the array.

21. (Canceled)

22. (Currently amended) An assembly according to ~~claim 21~~ claim 19, wherein the radiation comprises X-rays reflected from the sample over a range of angles, and wherein the array of detector elements is oriented in the enclosure such that ~~the~~ a first element of the array receives the radiation reflected from the sample in a

lower portion of the range of angles and ~~the~~ a last element of the array receives the radiation reflected from the sample in a higher portion of the range of angles.

23. (Original) An assembly according to claim 22, wherein the detector assembly comprises a readout circuit and a charge coupled device (CCD), which has an output connected to the readout circuit and is coupled to transfer charges generated by the detector elements responsive to the radiation from the detector elements to the output in sequence along the array beginning with the last element.

24-36. (Canceled)

37. (Original) A method for sensing radiation, comprising:

receiving X-ray photons emitted over a range of angles at an array of detector elements, so as to generate a signal indicative of respective charges accumulated by the detector elements due to the photons that are incident on the elements; and

determining, responsive to the signal, whether a high flux of the photons or a low flux of the photons was incident on each of the elements;

estimating the number of photons incident on each of the elements on which the high flux was incident by dividing the charges accumulated by the elements by a high-flux average charge; and

estimating the number of photons incident on each of the elements on which the low flux was incident by dividing the charges accumulated by the elements by a low-flux average charge, substantially different from the high-flux average charge.

38. (Original) A method according to claim 37, wherein determining whether the high flux or the low flux was

incident comprises determining that the high flux was incident on one of the elements when the charge accumulated by the element, not including a background charge, is at least three times the high-flux average charge.

39. (Original) A method according to claim 37, wherein determining whether the high flux or the low flux was incident comprises determining that the low flux was incident on one of the elements when no more than a single one of the photons was incident on the element over a period during which the charges were accumulated.

40. (Original) A method according to claim 37, wherein estimating the number of photons incident on each of the elements on which the low flux was incident comprises dividing the charges accumulated by a mutually-adjacent pair of the elements by the low-flux average charge, so as to determine whether one of the photons was incident on one of the elements in the pair.

41. (Original) A method according to claim 37, wherein receiving the X-ray photons comprises the X-ray photons reflected by a sample over the range of angles, characterized by a variation of flux of the reflected photons as a function of angle, such that the high flux is incident on the elements in a low-angle portion of the range, and the low flux is incident on the elements in a high-angle portion of the range.

42. (Currently amended) A method for detecting radiation, comprising:

enclosing an array of detector elements in an enclosure, the array ~~including a first element and a last element defining~~ having a length ~~of the array therebetween~~, the enclosure having a window at a front side thereof, which is adapted to allow radiation to pass therethrough, and which is positioned at a distance from

the array that is at least equal to the length of the array;

evacuating the enclosure containing the array; and

receiving the radiation at the array and generating a signal responsive thereto.

43. (Original) A method according to claim 42, wherein the distance from the array to the window is at least twice the length of the array.

44. (Original) A method according to claim 42, wherein receiving the radiation comprises receiving the radiation emitted from a sample outside the enclosure.

45. (Currently amended) A method according to claim 44, wherein the radiation comprises X-rays reflected from the sample over a range of angles, such that ~~the~~ a first element of the array receives the radiation reflected from the sample in a lower portion of the range of angles and ~~the~~ a last element of the array receives the radiation reflected from the sample in a higher portion of the range of angles, and wherein generating the signal comprises transferring charges generated at the detector elements responsive to the radiation to an output from the detector elements in sequence along the array beginning with the last element.

47-49. (Canceled)